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INTRODUCTION

The Annual Logan Ground Access Update provides to the Executive Office of Environmental Affairs (EOEA) and interested parties a summary of traffic levels and ground access trends at Logan during each year. The 1990 Annual Update, as were those for 1987, 1988, and 1989, complies with the scope issued in April 1988 by the Secretary of Environmental Affairs with the Certificate for the Logan Generic Environmental Impact Report (GEIR). The scope requires the Update to "include the identification of new ground access problems which have arisen subsequent to the most recent filing, and the proposed mitigation measures to redress identified problems." In addition, the Boston Transportation Department has "requested that the annual report provide a 'people balance' analysis which shows the relationships between passengers, flights, and transit use."

This update builds on earlier Annual Ground Access Reports noted above. The Updates will be utilized in the historical portions of the next Logan GEIR which will be submitted in the late fall of 1991.

The main text of the 1990 Ground Access update is divided into three parts. Part One addresses the current status of Logan ground

access, with some attention given to demand and supply trends from recent years. First, the factors that influence demand for ground transportation (such as air passenger volumes) are examined. Second, the supply of ground transportation services is briefly reviewed. Third, the report describes the current ground traffic situation. Part Two presents a summary of two major 1990 studies - pertaining to Logan passengers and Logan employees. Part Three presents an updated summary of Massport's ground access mitigation efforts.

For those who desire greater detail on particular issues, technical appendices are attached. Appendix A provides additional information on 1990 Logan ground traffic volumes as measured by airport traffic monitors. Appendix B presents monthly and annual changes in Logan air passenger characteristics and passengers' access mode choices from 1986 to 1990. Appendix C describes the annual and monthly Logan Express and the Water Shuttle ridership over the past few years. Appendices B & C allow one to consider seasonal trends and monthly variations, as well as annual changes. Appendix D is a copy of the Proposed EPA Rule on the proposed Logan Parking Freeze Amendment as it appeared in the Federal Register (Nov. 6, 1990).

PART ONE: LOGAN GROUND ACCESS TO DATE

DEMAND FOR GROUND TRANSPORTATION SERVICES

Over the years, the trends in air travel, air cargo and airport employment that shape the demand for Logan ground transportation have all contributed to and suffered from growing ground access congestion of Logan's major highway access and egress routes. Logan traffic has increasingly competed with other regional travel needs for limited highway space. This competition is most evident in the Sumner/Callahan Tunnels and on the Central Artery.

The major component of demand on the Logan ground access system is from the air passengers. Since roughly 10% of air passengers at Logan are interline transfers, approximately 90% of the passengers make use of the ground access system. Table 1 shows the number of air passengers and the number of flight operations handled at the airport in each of the past nine years. In 1990, Logan Airport served 47% more air passengers than it did in 1981. Growth in passenger volume, however, has not been uniform over that period. As can be seen in Table 1, passenger activity in 1990 rebounded somewhat (+2.7%) from the 6% decline in 1989. The 1990 growth was substantially smaller than the growth rates experienced from 1982 to 1987. The Logan passenger growth rate over the next few years is

expected to be more modest than it was in the early 80's. For example, by 1992, an annual volume of approximately 24.0 million passengers is expected at Logan, unless the regional economy continues to decline. (This activity level was previously approached in 1987 - 1988, before the onset of the economic downturn.)

A similar trend is observed in the number of aircraft operations. Between 1982 and 1990 total aircraft operations increased by 55%, with much of the growth occurring in the early years of the period (Table 1). Aircraft operations decreased by 2% in 1988, as compared to a 2% increase in passengers. In 1989, there was a sharp drop (-5%) in aircraft operations largely related to the strike of Eastern Airlines, and passenger levels also declined (-6%). In 1990, there was a 9% increase in aircraft operations over 1989, while passenger volumes increased by almost 3%.

TABLE 1

HISTORICAL LOGAN AIR PASSENGER AND OPERATION VOLUMES

Year	Air Passengers	Annual Change	Total Flight Ops **	Annual Change
1981	14,827,684	--	284,094	--
1982	15,876,722	7.1%	275,457	-3.0%
1983	17,848,797	12.4%	316,114	+14.8%
1984	19,417,972	8.8%	342,924	+ 8.5%
1985	20,448,424	5.3%	380,015	+10.8%
1986	21,862,718	6.9%	396,096	+ 4.2%
1987	23,283,047	6.5%	414,968	+ 4.8%
1988*	23,732,923	1.9%	407,617	-1.8%
1989*	22,272,690	-6.1%	388,792	-4.6%
1990*	22,878,192	2.7	424,568	+ 9.2%

* - includes General Aviation passengers (56,000 to 72,000 per year). No General Aviation passengers in 1981 through 1987 passenger numbers. (See Appendix B-1).

** - includes Domestic and International Air Carrier, Commuter and General Aviation operations

Another component of demand on the Logan ground access system is from employees commuting to the airport for work. Historically, information on employment levels at the airport has been difficult to obtain. This deficiency has been addressed, however, by the 1990 Employee Survey. Approximately 15,500 people are estimated to work at the airport currently (with about 62% or 9,600 of them commuting to Logan on an average weekday). (See Logan Employee Survey in Part Two.) As air passenger volumes and aircraft operations continue to grow, the workforce needed to serve these volumes will also expand.

Air cargo tonnage also contributes to vehicular traffic at the airport, especially in the form of truck traffic. In 1990, air cargo tonnage increased by 9% from the 1989 levels (from 314,746 tons to 341,717 tons), which was also higher than the 1988 level of 333,267 tons. Between 1983 and 1990, air cargo tonnage at Logan grew by over 35%. Historically, the annual cargo percentage changes tend to vary from year to year showing an upward trend over time.

SUPPLY OF GROUND TRANSPORTATION SERVICES

Through the efforts of Massport, the MBTA and the private sector, the availability and variety of ground transportation services at the airport have grown along with the increasing demand for Logan ground access. These services provide alternatives to lower occupancy modes like the private automobile access for Logan users.

First, existing high-occupancy transit modes have expanded their capacities. Over the past 10 years, the MBTA has improved its Blue Line service. The MBTA airport station is serviced by Massport's on-airport shuttle bus, which has expanded service, eliminated all fares, and reduced headways (see Part Three). It is estimated that 8% of the air passengers and 10% of the airport employees used the MBTA on an average weekday in 1990 (see Chapter 2).

Second, over the past decade, private bus and limousine services have increased their airport operations. In 1990, the airport market was served by over 700 registered bus and limousine operators. The expansion of these services over the years has shown their ability to absorb increases in ridership. In 1990, however, there was a decline in the number of passengers using scheduled bus and limo service (see Part Three). Massport provides holding areas for these buses and limousines, near the Central Garage and at each terminal's curb.

Third, new high-occupancy transit services, such as Logan Express and the Water Shuttle, have been created in recent years. In 1990, Logan Express buses served the South Shore area from Quincy/Braintree and the western suburbs from Framingham. The Framingham terminal includes an enclosed waiting area and an 180-space attended parking lot at Shopper's World. In Quincy, the Logan Express passengers used the MBTA parking facility at the Quincy-Adams MBTA station. In July 1990, the service was moved from Quincy-Adams to Braintree, with a resulting increase in ridership (see Chapter 3). In 1990, Logan Express services from Quincy/Braintree and Framingham with one-way fares of $5 and $7, respectively, operated most of the day at 30- to 60- minute headways. The Logan Water Shuttle ferries passengers between Rowes Wharf and the renovated Bird Island Flats dock at the airport. In 1990, the Water Shuttle operated at 15-minute headways with a one-way fare of $7. (See Part Three)

The number of commercial parking spaces at Logan is limited by a parking freeze implemented in October, 1975 by the U.S. Environmental Protection Agency (US EPA) and the Massachusetts Department of Environmental Quality Engineering (now Department of Environmental Protection). This freeze limits the airport to 10,215 commercial spaces, but does not limit the number of parking spaces set aside for Logan employees.

For private automobiles, Massport also currently provides up to 2,000 "overflow" spaces for which no fee is currently charged. These spaces are utilized on peak parking days after the 10,215 commercial spaces are filled.

In December, 1988, the Metropolitan Planning Organization (MPO) submitted a proposed parking freeze amendment to MA DEQE which would revise the 1975 Logan Freeze, by adding an East Boston Freeze on airport related activity, and cap the total number of employee and commercial spaces at Logan. In 1989, the DEP adopted this proposal which appears in the State's air quality regulations (310.CMR 7.30, 7.31). In 1990, this rulemaking still awaited final action by the US EPA. A proposed rule appeared in the Federal Register on November 6, 1990 (see Appendix D). When EPA adopts this amendment, the new cap on Logan Airport parking would be 19,315 spaces, including no more than 7,100 employee spaces, and no fewer than 12,215 on-airport commercial spaces. There would also be a cap on off-airport commercial parking spaces and off-airport car rental spaces in East Boston which are neither owned nor operated by Massport. The proposed amendment allows Massport to convert on-airport employee spaces to commercial spaces. (see Part Three)

Massport provides on-airport parking for rental cars and commercial parking for private automobiles. In 1990, on-airport rental car companies had the capacity to accommodate around 5,000 vehicles at Logan.

In 1990, Massport dispatched 1.33 million taxis from the taxi pool, compared to 1.34 million in 1989*. In the future, the volume of taxi service may be constrained by the level of traffic congestion on highways to and from Logan.

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* outbound taxis only

1990 TRAFFIC VOLUMES*

Since the early 1980's, Logan has experienced an increase in ground access traffic driven primarily by passenger growth. The annual average daily trips (AADT) from the past ten years are given in Table 2. Between 1981 and 1990, daily vehicular ground access trips grew by 17%. Ground traffic volumes have not increased as rapidly as air passenger volumes, which grew 47% during the same period. (See Table Two)

In 1988, passenger volumes grew by 1.9% while vehicular trips fell by 3.6%. In 1989, vehicular traffic continued to decrease slightly (-0.4%), but proportionately much less than passenger volumes (-6.1%). In 1990, vehicular traffic increased at a rate (+2.5%) comparable to growth in air passengers (+2.7%). When considering the relationship of ground access vehicles to air passengers, it is important that overall trends be included, and not only one particular year. Over the past decade, the number of air passengers has grown much faster than the number of ground access vehicles.

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* The various vehicular flow measures used in the report are as follows:
AADT = Average Annual Daily Trips (annual total divided by 365)
AWDT = Average Weekday Daily Trips
(Total of 5 weekdays divided by 5 in a typical week.) (Annual average weekday is numerical average of all weekdays.) Weekday traffic is heaviest on Thursday & Friday, & lightest on Tuesday. (At Logan, AADT can be converted to AWDT by multiplying AADT by approximately 1.04)

In addition to daily traffic flows, weekday AM and PM peak hours are sometimes considered in order to highlight periods of greatest congestion.

TABLE 2

AVERAGE ANNUAL DAILY (VEHICLE) TWO WAY TRIPS (TO AND FROM LOGAN)

AADT and Annual Daily Passengers

Year	AADT	Annual Change %	Average Annual Daily Passenger	(Annual Passenger Change%)
1981	69,800	--	40,620	
1982	71,400	2.3	43,500	(7.1)
1983	77,400	8.4	48,900	(12.4)
1984	78,800	1.8	53,050	(8.8)
1985	80,600	2.3	56,020	(5.3)
1986	80,800	0.2	59,900	(6.9)
1987	82,800	2.4	63,790	(6.5)
1988	79,800	-3.6	64,840	(1.9)
1989	79,500	-0.4	61,020	(-6.1)
1990	81,400	+2.5	62,680	(+2.7)

Over the past few years, some of the changes in AADT have been attributed to variations in weekend traffic. It is important, therefore, that the comparisons of the last five years be made among annual AWDT, annual average traffic on Saturday and Sundays, and to annual average daily trips (AADT). These comparisons are presented in Table 3.

TABLE 3

Vehicular Traffic To and From Logan

Year	Annual AWDT		Annual Sat/Sun Avg.		AADT	
				%		%
1985	84,200	-	71,800	-	80,600	-
1986	83,500	(- 0.8)	74,000	(+ 3.0)	80,800	(+ 0.2)
1987	84,300	(+ 0.9)	78,900	(+ 6.7)	82,800	(+ 2.4)
1988	84,500	(+ 0.2)	68,550	(-13.0)	79,800	(- 3.6)
1989	83,300	(- 1.4)	70,000	(+ 2.1)	79,500	(- 0.4)
1990	86,000	(+ 3.2)	70,000	(-)	81,400	(+ 2.4)

In 1990, the AWDT traffic increased (+3.2%) while weekend traffic remained constant. (As noted in previous reports, the weekend variations are correlated largely to the availability of discount fares.)

1990 On-Airport Traffic

The distribution of vehicles varies among the different airport entry and exit ramps. See Figures 1 and 2 for a sample airport traffic map illustrating annual average daily (AADT) and annual average weekday (AWDT) vehicular trips, respectively. Based on AADT in 1990, 90% of Logan-bound vehicles entered the airport from the Route 1A ramps, 9% from Frankfort Street, and 1% from Maverick Street. At the same time, 35% of vehicles exited via Route 1A northbound, 40% via Route 1A southbound, 13% by Frankfort Street, and 3% by Maverick Street. These distributions are similar to previous years. (See Appendix A.)

In 1990, the channelization of the Sumner Tunnel toll plaza and other traffic design modifications (implemented in 1987) continued to result in better flows of traffic on Route 1A southbound and at the Sumner Tunnel toll plaza.

Figure:1

Annual Average Daily Traffic 1990

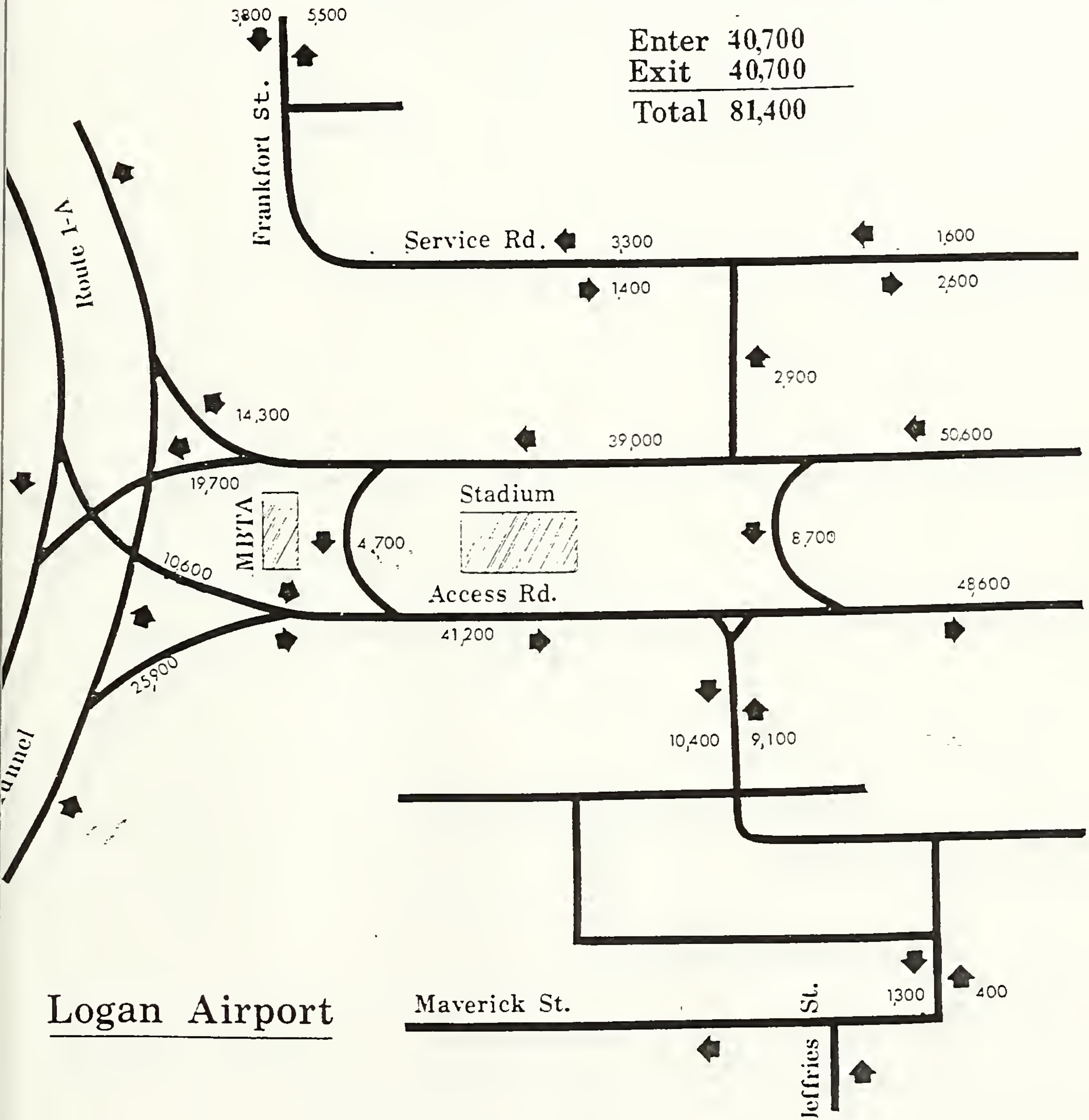
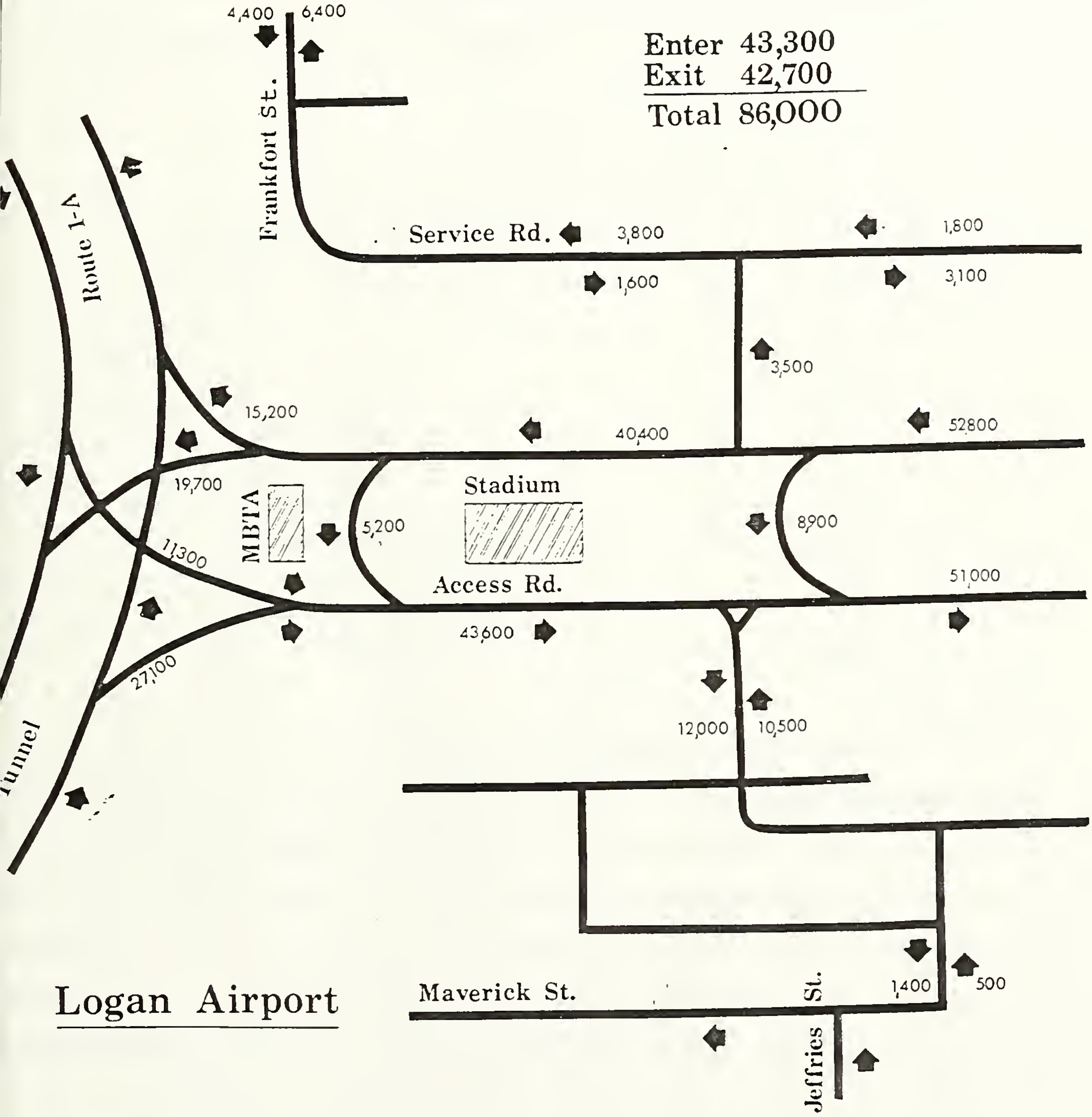


Figure:2

Annual Average Weekday Traffic-1990



The annual AWDT traffic entering and exiting Maverick St. and Frankfort St., Neptune Rd. from 1985 to 1990 can be found in Table 4. (These volumes are presented in annual AWDT since the routes are utilized largely during the weekdays.)

TABLE 4

Non-Highway AWDTs To/From Logan

	Neptune Rd./Frankfort St.		Maverick St.	
	in	out	in	out
1985	5300	6700	1100	2800
1986	4800	6800	500	1900
1987	5000	6000	500	1800
1988	4600	6800	600	1600
1989	4000	6100	400	1300
1990	4400	6400	500	1400

There have been variations in Logan-based traffic using the Frankfort St./Neptune Rd. route over the five year period, but there have been steady reductions of Logan-based traffic at Maverick St. The high volumes exiting via Frankfort St./Neptune Rd. reflect not only people traveling to nearby communities, but also Sumner Tunnel congestion. The declining volumes at Maverick St. over a six year period reflect a series of the gate restrictions imposed by Massport to divert airport traffic off local streets to the airport roadways.

The use of Neptune Rd./Frankfort St. in 1989 declined 13% compared to 1988 for entering traffic and 10% compared to 1988 for exiting traffic. In 1989, the use of Maverick St. also continued to decline for both entrances and exits. In 1990, however, the entering and exiting traffic at Frankfort St./Neptune Rd. increased somewhat. The vehicles at Maverick St. in 1990 were fairly consistent with the lower volumes in recent years.

On-airport traffic patterns and AADT and AWDT volumes are discussed more fully in Appendix A.

1990 Regional Traffic: Peak Hours

At the request of the Executive Office of Environmental Affairs, Massport commissioned the Central Transportation Planning Staff (CTPS) to perform an analysis of the impact of Logan-bound traffic on the 1987 regional highway network (the most current coded network). The results of that analysis were presented in the 1987, 1988 and 1989 Annual Ground Transportation Updates. Based on the 1987 PM peak hour traffic data presented in previous updates, Logan-bound vehicles contributed a greater percentage of traffic to the PM peak hour than to the AM peak hour. Logan's PM traffic contribution is particularly high (as a percentage and as compared to the morning) in the Sumner Tunnel and on the Central Artery south of the tunnels. This larger PM contribution is the result of both a higher level of afternoon Logan traffic and a lower level of PM peak hour traffic to other destinations.

According to the CTPS model, during the average 1987 PM peak, Logan-related traffic generated about 20% of Central Artery traffic south of the tunnels and from 46% to 70% of the traffic in the tunnels. At the same time, Logan traffic made up less than 10% of traffic on most other regional highways. As noted in earlier ground access reports, the Logan share of the total highway traffic drops off sharply as the distance from the airport increased. Logically, the Logan ground access demand has the greatest effect on roadways close to the airport, which are already strained by other regional travel needs.

In addition to considering peak hour volumes of the regional system, one could also consider the regional AWDT levels. There was little variation between the 1987, 1988, 1989 and 1990 AWDT estimates for various highways in the regional network, just as there were few variations in AM and PM peak hours. Hence, modeling efforts indicate that the relationship between Logan trips to total trips remained virtually unchanged between 1987 and 1990, as did Logan's contribution to traffic in the Callahan and Sumner Tunnels.

PART TWO - 1990 GROUND ACCESS STUDIES

To understand the characteristics of airport users, Massport undertook two major surveys of airport passengers and employees in 1990.

1990 Logan Passenger Survey

The Massachusetts Port Authority commissioned studies of ground access travel patterns of airline passengers from Logan International Airport in the spring of 1979, 1984, and 1987. (Additionally, in 1984 a study of departing passengers was conducted in August as an effort to understand seasonal variations in ground access patterns.)

The 1990 air passenger study was conducted by Chadwick, Martin, Bailey Inc., between April 25 and May 8, 1990. A survey was administered to a sample of air passengers departing Logan Airport.

The objective of the 1990 study was to obtain an overview of ground access behavior, during the survey period, for the Authority's ongoing ground access planning program. Massport needs accurate air passenger market information to successfully promote shifts in ground access patterns. (See Table 5 for "market segments" estimated from the passenger survey.)

Significant changes, including airline mergers, acquisitions, changes at regional airports, expansion of ground access alternatives, route expansions, and consolidations occurred between 1987 and 1990. These changes, along with an economic downturn and a prolonged Eastern Airlines strike, affected the characteristics and ground access behavior of Logan air travelers. Information desired from the 1990 survey was:

- access mode distribution
- proportional distribution of air passengers in the four major Logan market segments defined by whether or not the trip is for business purposes and whether or not the traveller is a resident of the Boston/New England region.

The fieldwork was conducted for two weeks to:

- facilitate a controlled data collection process,
- avoid major disruptions of normal airport operations,
- avoid the weeks surrounding the Easter and Patriots' Day Holidays,
- provide adequate preparation time following the commissioning of the project, and
- provide a more stable and reliable sample base than previous studies.

Table 5 below illustrates mode choices by market segments for the years 1987 and 1990 from the air passenger surveys. Passenger surveys are useful in capturing a snapshot of air traveller choices and opinions. Comparison of survey data from different points in time is not necessarily reflective of trends in travel behavior over a longer span of time.

Table 5

Air Passenger Ground Access Choices by Market Segment, 1987 and 1990

	Resident Business		Resident Non-Business	
	%	%	%	%
	1987	1990	1987	1990
Dropoff	16	15	41	39
Taxi	15	13	12	12
Long Term Park	48	44	18	16
Rental Car	2	2	1	1
Door-to-Door	6	8	8	10
Scheduled HOV	7	11	10	12
* Transit	6	7	10	10
Total	100	100	100	100

	Non-Resident Business		Non-Resident Non-Business	
	%	%	%	%
	1987	1990	1987	1990
Dropoff	11	10	43	40
Taxi	35	32	16	14
Long Term Park	1	3	4	3
Rental Car	35	33	12	18
Door-to-Door	5	7	5	4
Scheduled HOV	6	5	11	9
Transit	7	10	9	12
Total	100	100	100	100

* In 1990, transit category included MBTA and water shuttle.

Within each market segment, the changes in most cases are within the statistical confidence intervals of the 1987 Air Passenger Survey. The resident business market shows a difference of 4% in long-term parking and a similar difference in scheduled high-occupancy vehicle (HOV) service. Non-resident business shows a 3% difference in taxicab use and a similar change in transit modes. The likely reason for this shift is that the Airport Water Shuttle was not in operation at the time of the 1987 survey and was fully operational in 1990. Non-resident non-business use of rental car ground access changed from 12% to 18%. In a word, the changes within each market segment were not dramatic.

Table 6

Overall Passenger Mode Shares (Combined Market Segment)

	1987	1990*
	%	%
Drop Off	26	23
Taxi	20	19
Long Term Park	20	17
Rental	12	15
Door to Door	5	7
Scheduled HOV	9	9
Transit	8	10
	100	100

* - In 1990, transit category included MBTA and water shuttle

1990 Logan Employee Survey

In 1989 Massport commissioned Charles River Associates to conduct a survey of Logan Airport employees and employers in the spring of 1990. The purpose of the survey was to update the Authority's knowledge of the number and types of Logan employees, and to collect information for estimating employee commute patterns for use in ground transportation planning. The design of the survey and the methodology employed were much more extensive and refined than previous Logan employee surveys.

Although detailed survey analysis of the 1990 employee survey is still underway, preliminary results indicate that in May of 1990 there were approximately 15,500 ground access employees commuting to Logan Airport, and an estimated 9,600 (or 62%) commuted on an average weekday. These numbers include Massport employees, Boston-based flight crew members, and all other employees of businesses located within the boundaries of Logan Airport (with the exception of Robie Park).

The following table is an estimate of how employees get to Logan on an average weekday.

Table 7

Ground Access Employee Mode Shares, Average Weekday, 1990

Source: Preliminary Estimates, based on 1990 Employee Survey

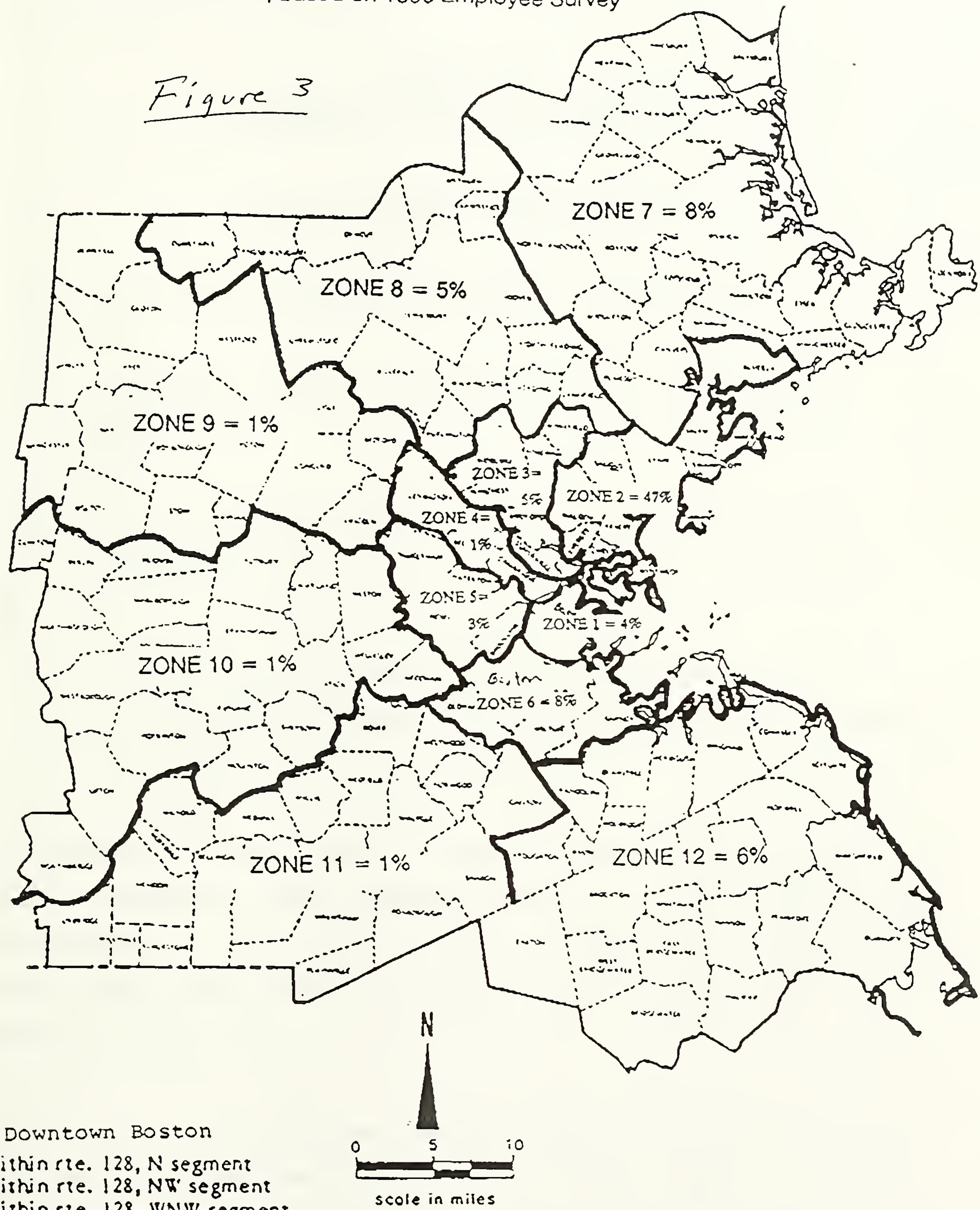
Access Mode	Employee Distribution (%)
Auto Dropoff	2
Auto Park	85
Scheduled HOV	1
MBTA	10
Other*	2
Total	100

*Other may include taxi, door-to-door reservation service, water shuttle, walk, etc.

The following map presents an estimate of ground access employee origins on an average weekday by CTPS superzone. Approximately 70% of employees commuting to Logan on an average weekday are coming from towns north of Logan and east of Rte. 3.

Distribution of Employee Origins by CTPS Superzone - 1990 Average Weekday
Source: Estimates, based on 1990 Employee Survey

Figure 3



1 = Downtown Boston
2 = within rte. 128, N segment
3 = within rte. 128, NW segment
4 = within rte. 128, WNW segment
5 = within rte. 128, W segment
6 = within rte. 128, S segment
7 = outside rte. 128, N segment
8 = outside rte. 128, NW segment
9 = outside rte. 128, WNW segment
10 = outside rte. 128, W segment
11 = outside rte. 128, SW segment
12 = outside rte. 128, S segment

Areas Not Shown On Map	
All Other Massachusetts Towns	= 4%
Maine, New Hampshire, Vermont	= 5%
Rhode Island, Connecticut	= 1%
All Other States	= 0%

22a

PART THREE

MASSPORT'S MITIGATION EFFORTS

SUMMARY OF MITIGATION EFFORTS

The three goals of Massport's mitigation program are:

1) to limit or reduce the number of vehicle trips made to Logan;

2) to minimize the deleterious effects of Logan groundside traffic; and

3) to improve the availability and reliability of cost-effective high occupancy vehicle access to the airport for passengers.

Attainment of these goals will require a reduction in growth of vehicular trips and traffic congestion which will improve air quality by minimizing air pollutants. To this end, Massport has continued to dedicate significant resources to ground access analysis and mitigation initiatives.

In addition to capital and planning expenditures, Massport spent approximately $10 million in 1990 on ground access operating costs. Massport's most important mitigation efforts are described below.

Logan Express and Remote Parking

Logan Express provides high-quality, reliable bus service to and from the airport as an alternative to low-occupancy vehicle travel. In 1990, Massport continued to operate airport express bus service from two suburban locations, Framingham and the Quincy-Adams MBTA Station/Braintree. The services are operated by private carriers under contract to Massport. The Authority currently subsidizes Logan Express with the aim of increasing high occupancy vehicle ridership among airport users. The monthly ridership history of Logan Express is given in Appendix C.

The Framingham Logan Express carried approximately 12,500 riders per month or an average of 574 per calendar day to and from Logan. The Framingham service operated from 5:30 AM to 11:45 PM, with headways of 30 minutes (60 minutes on weekends) and a one-way fare of $7 ($3 for Airport employees). Framingham, passengers can use an enclosed waiting area with amenities and a 180-space secured and well-lighted parking lot. The parking fee was $4 per day (compared to $10 per day for on-airport parking).

In 1990, the Quincy Adams/Braintree Logan Express carried approximately 11,000 riders per month or 361 per calendar day. In 1990, the service operated from 5:30 AM to 11:45 PM, with weekday headways between 30 and 60 minutes and a one-way fare of $5.00 ($2.50 for employees) The parking fee at Quincy Adams was $2.50 per day and the parking fee at Braintree is $4.00 per day.

Historically, the Quincy-Adams Logan Express carried substantially fewer passengers than the Framingham service. Massport's accumulating experience led to identification of the service terminal location within an MBTA station as a possible drawback to the feasibility of the operation. Because the service was located within an MBTA station, it had no unique identify of its own. Massport moved the service to Braintree in an effort to provide increased amenities, a unique identity, a highly-visible location, and dedicated, secure parking (275 spaces).

The relocation of the service to Braintree in July 1990 appears to have had a beneficial impact on overall ridership. Between July and December 1990, the ridership level at Braintree was significantly higher (+ 19%) than the same period in 1989, during which time the air passenger volumes increased by only 1.3%. From January through June 1990 the activity at Quincy/Adams increased 4.8% over the same period in 1989, similar to the increases in air passengers (+4.2%).

Water Shuttle

In 1984, Massport invested nearly $3 million to improve ferry docking facilities at the Bird Island Flats (BIF) development adjacent to Logan in East Boston, in order to accommodate a cross-harbor water shuttle service with bus service to and from Logan dock. Since then, Massport has experimented with several water shuttle operations. Prior to June 1987, the Water Shuttle was operated solely by Massport and ran only from Spring through the Fall season. The most successful venture has been the cross-harbor Logan Water Shuttle between Rowes Wharf (in Boston's financial district) and BIF, which began operating in 1989 as a joint venture between Massport and the Rowes Wharf developer, the Beacon Companies. (After a three-year transition period ending in 1990, Massport reduced its financial support to the water shuttle operation).

From January through June in 1989, the shuttle operated every 15 minutes with a one-way fare of $6.00, and it was highly competitive with taxi fares from downtown. The water shuttle fare was increased to $7.00 in July 1989. During the first year of ridership, June 29, 1987 to June 28, 1988, the Water Shuttle carried 150,008 passengers (or an average of 411 per day). In 1988, the total Water Shuttle ridership was 193,831 (or 531 per day). The total Water Shuttle ridership for 1989 was 182,391 (or 500 per day). In 1990, ridership levels on the Water Shuttle were comparable to those in 1989 (181,530 or 497 per day). The slight decline in ridership over the past several years might be attributed to several factors: weather patterns, the fare increase from $6 to $7 in 1989, or changes in the economy which resulted in reduced business air travel.

Airport Shuttle Bus/MBTA

For some time, a shuttle bus system has operated to move passengers, employees and visitors on, off and within Logan. Massport took over operation of the airport shuttle bus system from the MBTA in July, 1976. Since that time, Massport has improved the system by combining the inter-terminal and subway shuttle bus systems and by dividing the old, slow, single route into a three-route system with better headways and more direct service. The aging buses were replaced with new shuttle coaches that offered greater reliability and passenger comfort. Despite this large capital investment, the Authority also eliminated the shuttle bus fare in 1984 to encourage both travelers and employees to use the MBTA for airport access.

The Logan shuttle bus system in 1990 operated between 5:30 AM and 1:00 AM, seven days a week, with 6-minute headways during peak periods and 12-minute headways during the off-peak. This improved service encourages the use of the Blue Line for getting to and from the Airport. In 1990, roughly 2.9 million people (over 7,900 people per calendar day) used the Blue Line subway to reach or leave the airport, compared to similar numbers in 1988 and 1989. The Blue Line has the capacity to handle greater volumes of riders if the demand continues to grow.

From 1986 to 1988, the ratio of total Blue Line users (including passengers, employees, and others) to total passengers remained constant at 0.122. In 1989, the ratio increased to 0.128 reflecting that MBTA ridership levels remained constant while Logan passenger volumes declined. In 1990, the ratio of MBTA use to total annual passengers was 0.124. In a word, the MBTA use relative to passengers

has not varied significantly over the past 4 years. Airport shuttle use can be expected to increase as Logan passenger levels increase.

Promotional Advertising and Public Information

Massport has developed an aggressive ground access promotional advertising and marketing program. The million-dollar program uses radio announcements, newspaper advertisements, and mailings to make the public aware of the Logan ground access problem, access mode alternatives, and the benefits of suggested alternatives to being picked up and dropped off by private automobile, such as Logan Express. This program continues year-round, although special attention is given to the seasons when air travel is heaviest. In 1989 and 1990, there was a shift in emphasis in the primary media message from telling the public that there is a ground access problem to informing the public of the alternatives to driving, as well as focusing on reducing the drop off and pick-up modes.

In addition to the advertising and marketing program, in 1990 the Authority continued to operate a ground access information hotline and expanded terminal information booths. The 24-hour hotline, 1-800-23-LOGAN, offers up-to-date travel information as well as information on ground access options other than private automobile use. The Massport booths in Terminals A, C, and E offer ground transportation information to travelers. By helping travelers to make fully-informed ground access decisions, the advertising, hotline, and information booth programs have encouraged the use of high-occupancy vehicle modes.

Limousine and Bus Service Improvements

In 1990, Massport continued to encourage independent limousine and private bus service to the airport. Limousines and buses have clearly designated curb space and an improved holding area with dispatchers on duty. Massport has also extended marketing and other forms of assistance to limousine and bus operators to increase high-occupancy vehicle use. In 1988, 611 operators were registered with Massport to serve the airport. By 1990, over 700 were registered.

Over the past four years there has been a shift in distribution of passengers carried by the scheduled bus and limousine operators and those carried by the non-scheduled limousine services. Nevertheless, the ratio of bus/limo riders to total passengers remained constant until 1990, when several of the scheduled carriers experienced economic hardships. The annual volumes are as follows:

Table 8

	Scheduled* Bus/Limo	Non-Scheduled** Limo	Total	*** Ratio of Annual PAX carried by Bus/Limo to Total Annual PAX
1987	1,172,441	288,863	1,461,304	0.063
1988	1,121,541	380,798	1,502,339	0.063
1989	964,380	449,617	1,413,397	0.063
1990	650,300	436,800	1,087,100	0.048

* two way trips
** one way only - outbound
*** ratio does not include inbound un-scheduled limo trips.

Share-a-Cab

Although the Share-a-Cab program has been discontinued due to declining ridership, Massport's curbside dispatchers do engage in multiple-fare taxi loading when the taxi supply is limited due to traffic congestion in the tunnels. This practice increases the average vehicular occupancy at times of greatest demand.

Curbside Control Improvements

The Massport initiatives to improve traffic flow at the terminal curbsides continued in 1990. At Terminal E, traffic was segregated by the construction of an island to facilitate access to the terminal. The Authority has also augmented its curbside dispatcher training program to better prepare its transportation agents in customer service and good operating procedures to handle travel and congestion peaks. Massport has also hired a force of civilian ticket writers to discourage extensive private automobile parking in the metered and special permit lots.

Improved Tunnel Access

The channelization of traffic approaching the Sumner Tunnel has been quite successful since its implementation in 1987. It has improved tunnel throughput by distributing traffic more evenly among toll booths and has reduced the uneven toll lines that encouraged drivers (especially taxis) to detour through East Boston streets. Channelization has also increased the volume of traffic that can

utilize Route 1A and it reduces the frequency of closures of the so-called "point", the southbound ramp to the Sumner Tunnel).

Massport now regulates access to the southbound ramp between the airport roadways and Route 1A for traffic control. When traffic is flowing well, the "point" is open to all vehicles. During periods of traffic congestion, the "point" becomes a commercial vehicle lane only, open only to commercial vehicles, many of which are high occupancy vehicles. When Route 1A is congested near the tunnel entrance, the point is closed to all non-commercial vehicles, which are diverted north to the Neptune Rd. exit where there is a U turn back toward the Sumner Tunnel via Rt 1A. The commercial vehicle lane maintains smoother traffic flows on the airport roadways and keeps commercial vehicles off the streets of East Boston. The improved flows to the tunnel via channelization have reduced diversion of Logan-based 1A southbound traffic on local East Boston streets.

Another improvement that prevents Logan-related traffic from using East Boston streets is the closure of the off-ramp at Rt. 1A north bound - Neptune Rd. during peak traffic conditions. During the peak traffic period the ramp is closed to all traffic, other than to those vehicles making a U turn to Rt. 1A south bound.

In addition, Logan users coming to Logan via the Callahan Tunnel are still reaping the benefits of the institution of one way tolls in 1983. This action has dramatically increased Callahan Tunnel throughput during peak hour conditions.

Parking

For travelers, the daily rate for commercial parking at the airport was raised July 1, 1986 to $10 where it remained through 1990. For employees in 1990, the monthly employee parking fee was $40. Massport in 1990 also continued to study reducing private automobile travel to Logan through the design of a remote parking lot for employees north of Logan along Rt.1A. The remote lot might foster employee ridesharing or transit access. The results of the Logan Employee survey will be utilized to determine the most effective use of the lot.

In 1988, the ratio of total parking exits to total airline passengers increased from 0.132 to 0.142 (similar to the 1986 level.) In 1989, the ratio increased to 0.157. It is difficult to assess the multiple factors that contributed to these changes. (In 1989, although there was a decline in passengers as well as vehicles, the parking exits increased slightly over 1988.) In 1990, the ratio of parking exits to total passengers declined to 0.147. See Appendix B B-4).

Proposed Logan Parking Freeze Amendment

An amendment to the 1975 Logan parking freeze was proposed in 1988, adopted by DEP in 1989, and was considered in 1990 by the US EPA. The proposed rule was published in the Federal Register on November 6, 1990. As previously noted, this amendment would close existing loopholes and cap the number of commercial and employee spaces at Logan.

The proposed amendment allows Massport to convert on-airport employee spaces to commercial spaces. The amendment would not, however, allow the conversion of commercial spaces to employee spaces. (For more information on the proposed amendment, see Appendix D.)

The logic of the proposed freeze amendment is as follows:

(1) The Logan freeze as implemented in 1975 restricts growth in commercial parking spaces but not employee parking spaces. This is problematic because non-flight crew employees commute and park on a daily basis, whereas the average airline passenger parks for 3 days. Hence, there is a logical flaw in the current parking freeze as implemented vis-a-vis regional air quality objectives, since it does not apply to those vehicles responsible for many of the Logan-bound VMTs and subsequent air pollution. This flaw is being corrected in the proposed freeze amendment.

(2) The air quality benefits derived from the Freeze Amendment are based on how would-be parkers choose among alternate access modes on peak days, if there were no parking places available at Logan or in East Boston. Based on our passenger surveys and mode choice models, it is estimated that over half of the would-be parkers who cannot find a parking space would be diverted to a drop-off/pick-up mode, generating four trips instead of two for each travel party. This results in increased VMT and worsened air quality.

(3) There are clear air quality benefits for converting employee to commercial spaces. If the employees are parking at remote lots north of the residential community of East Boston, the length of the trip for employees who live north of Logan may be reduced on average. In addition, there are clear air quality benefits if a passenger is able to park at Logan instead of being diverted to a drop-off/pick-up mode. It is estimated that the VMT savings is roughly 15 vehicle miles of travel per day per space converted, which can easily be translated to regional air quality benefits (as the hydrocarbon emissions and carbon monoxide levels are reduced).

TECHNICAL SUPPORT AND PLANNING

In 1990, Massport continued to invest heavily in technical support, analysis, and planning for the ground access mitigation program. Massport full-time ground access staff and consultants conducted ongoing policy service design, and traffic engineering studies at the airport, concentrating on improving HOV access and use. The engineers and analysts are now aided by a newly-installed system of automatic traffic counters located on airport. At the same time, the Central Transportation Planning Staff (CTPS) has been engaged to analyze the effects of various current and prospective ground access alternatives. CTPS integrates work in Logan ground access with the regional highway and transit networks. In 1990, the Authority continued to expand its understanding of ground access service provision through a variety of efforts.

LOGIC - Logan Growth and Impact Control

In 1990, Massport continued its work on a major study - LOGIC (Logan Growth and Impact Control) which is designed to identify ways in which Logan Airport could grow in the future without exceeding its environmental impacts in 1987. One of the major components of LOGIC is its work on ground access. This work explores ways in which Logan-related vehicles can be kept off the local East Boston streets as much as possible. The results of Phase I of the LOGIC study will be presented with the submission of the Logan GEIR in Fall of 1991.

The Logan GEIR

During 1990, the Logan GEIR was in preparation. This document will not only review recent history of Logan activity but will also estimate 1992 impacts. Moreover, the Logan GEIR will provide a planning context for future capital projects at Logan.

APPENDIX A

1990 Ground Traffic Volumes at Logan Airport

1990 GROUND TRAFFIC VOLUMES AT LOGAN AIRPORT

K. H. SCHAEFFER
PLANNING AND OPERATIONS RESEARCH

3 Acacia Street
Cambridge, MA 02138-4818

Prepared for the Massachusetts Port Authority
under contract No. L-5259

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1990 GROUND TRAFFIC VOLUMES AT LOGAN AIRPORT

The estimates of the 1990 average daily ground traffic volumes at Logan International Airport were derived from (a) the 1990 data collected by Massport's Automated Traffic Monitoring System at the Airport, (b) The 1989 calibration of ATMS, (c) data collected by the occasional traffic counts of the non-ramp entrances and exits to the Airport, (d) the 1990 Logan Parking Garage exit counts and (e) the monthly air passenger statistics for Logan International Airport. See the Appendix for a detailed description of the methodology.

I. TOTAL SCREEN LINE COUNT - ANNUAL AVERAGE DAILY TRAFFIC.

During 1990, the estimated annual average daily traffic entering and leaving Logan was 81,400 vehicles. This was an increase of 1,900 vehicles a day from 1989, reversing the decline of the past two years. The 1990 traffic was, however, 1,400 vehicles per day less than observed during the peak year 1987.

TABLE I

ANNUAL AVERAGE DAILY GROUND TRAFFIC ENTERING AND EXITING LOGAN

	VEHICLES
1985	80,600
1986	80,800
1987	82,800
1988	79,900
1989	79,500
1990	81,400

Most changes in total traffic between 1989 and 1990 were quite marginal. The increase of 2.4% in vehicular traffic is slightly less than the growth in air-passenger traffic of 2.7%. The number of taxis carrying passengers from Logan and the MBTA ridership decreased by less than 1%, while the ridership of the Logan Express Service increased by 6%.

During 1990, the increase in traffic that entered and left Logan by the direct access ramps from and to the Tunnels was even greater than the total increase in vehicular traffic. Thus, the total traffic moved more smoothly.

II. ANNUAL AVERAGE DAILY TRAFFIC BY ENTRY AND EXIT POINTS.

Table II lists the average daily ground traffic volumes by entry and exit points. The traffic volumes are indicated for 1988, 1989 and 1990.

TABLE II

ANNUAL AVERAGE DAILY GROUND TRAFFIC VOLUMES AT LOGAN AIRPORT

ENTRIES & EXITS	'88 AADT	%	'89 AADT	%	'90 AADT	%	CHANGE '89/90
RAMP FROM 1A NB	35,500	89	25,300	64	25,900	64	2%
RAMP FROM 1A SB	(1)		10,600	26	10,600	26	0%
FRANKFORT ST	4,000	10	3,400	9	3,800	9	11%
MAVERICK STREET	500	1	500	1	400	1	-20%
TOTAL ENTRIES	39,900	100	39,700	100	40,700	100	3%
RAMP TO 1A SB	18,800	47	17,900	45	19,700	48	10%
RAMP TO 1A NB	13,900	35	15,500	39	14,300	35	-8%
FRANKFORT ST	5,800	15	5,300	13	5,500	14	4%
MAVERICK STREET	1,400	3	1,100	3	1,300	3	18%
TOTAL EXITS	39,900	100	39,800	100	40,700	100	2%

(1) In 1988 traffic could not be allocated between the two inbound ramps.

During the past year the most significant change in traffic exiting and entering the Airport occurred on the two ramps leaving Logan. There was a full ten percent increase, or 1800 vehicles per day, that were able to access the Sumner Tunnel directly from the Airport. These vehicles are equal to the entire new exiting traffic of 900 vehicles and represent additionally three quarters of the decline in the traffic that had to be diverted to the Northbound Ramp.

III. GROUND TRAFFIC VOLUMES BY TYPE OF DAY

Ground traffic at Logan varies by day of the week. Table III indicates the differences in 1990 average daily traffic between weekdays, Saturdays and Sundays. Over the past several years, until 1987, traffic rose sharply on Saturdays and Sundays while remaining rather steady on weekdays. Since 1987, peak Saturday traffic declined by 15%, Sunday traffic by 8% and weekday traffic increased by 2%. Though Saturday traffic has declined steadily over the past three years, Sunday traffic has increased slightly for the past two years.

Table III

LOGAN GROUND TRAFFIC BY TYPE OF DAY - 1990

ENTRY AND EXIT POINTS	AVERAGE WEEKDAY	AVERAGE SATURDAY	AVERAGE SUNDAY	AVERAGE DAY
RAMPS FROM 1A NB	27,100	21,300	24,600	25,900
RAMPS FROM 1A SB	11,300	8,100	9,600	10,600
FRANKFORT STREET SB	4,400	2,400	2,200	3,800
MAVERICK STREET EB	500	300	200	400
TOTAL ENTRIES	43,300	32,100	36,600	40,700
RAMP TO 1A SB	19,700	19,100	20,100	19,700
RAMP TO 1A NB	15,200	10,200	14,000	14,300
FRANKFORT STREET NB	6,400	3,000	3,300	5,500
MAVERICK STREET WB	1,400	900	700	1,300
TOTAL EXITS	42,700	33,200	38,100	40,700
TOTAL 1990 TRAFFIC	86,000	65,300	74,700	81,400
TOTAL 1989 TRAFFIC	83,300	66,500	73,500	79,500
TOTAL 1988 TRAFFIC	84,500	65,900	71,200	79,800
TOTAL 1987 TRAFFIC	84,300	76,900	80,900	82,800
PERCENT CHANGE FROM '89	3%	-2%	2%	2%
PERCENT CHANGE FROM '88	2%	-1%	5%	2%
PERCENT CHANGE FROM '87	2%	-15%	-8%	-2%

IV. INTERNAL TRAFFIC PATTERNS

The estimates for the 1990 internal traffic patterns are summarized in Figures 1 through 4. Figure 1 shows the traffic patterns on the average day, Figure 2 on the average weekday, Figure 3 on the average Saturday and Figure 4 on the average Sunday.

The 1990 estimates are based on the 1989 screen line estimates and the relative traffic flows along the Access and Egress Roadways during the week of April 21 to April 27, 1989. The 1989 internal traffic flow survey was conducted with Logan's Automatic Traffic Monitoring System. These were the first reliable internal traffic flow counts since April 1984. The primary difference between the two counts is a sharp decline in the traffic returning to the terminal particularly via the MBTA loop. In 1984, the AADT ratio between cars returning to the terminal and exiting via the ramps was 0.51. By 1989 the ratio had dropped to 0.39. The 1990 ATMS data confirms this ratio.

Figure:1

Annual Average Daily Traffic 1990

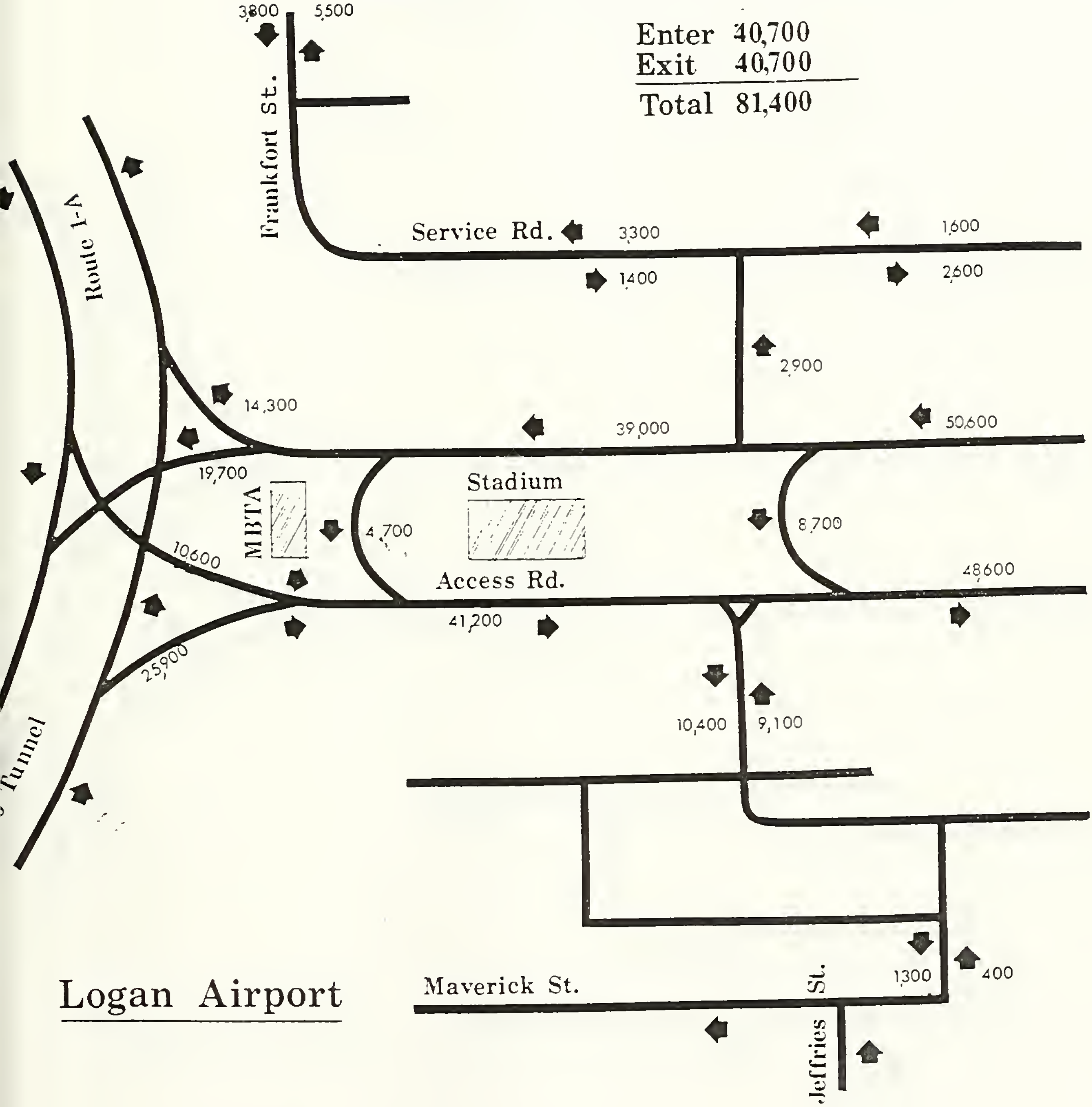


Figure:2

Annual Average Weekday Traffic-1990

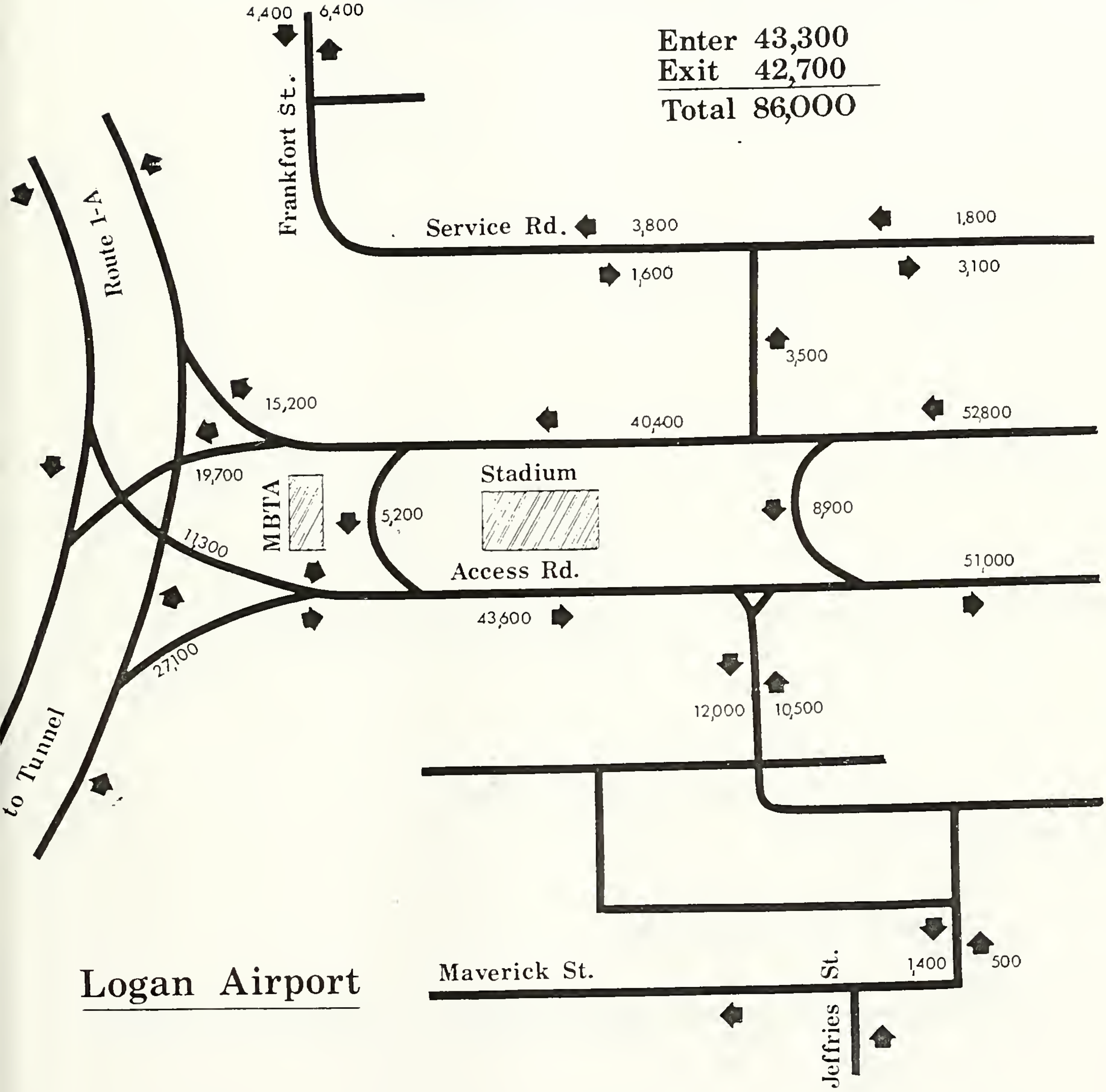


Figure:3

Annual Average Saturday Traffic -1990

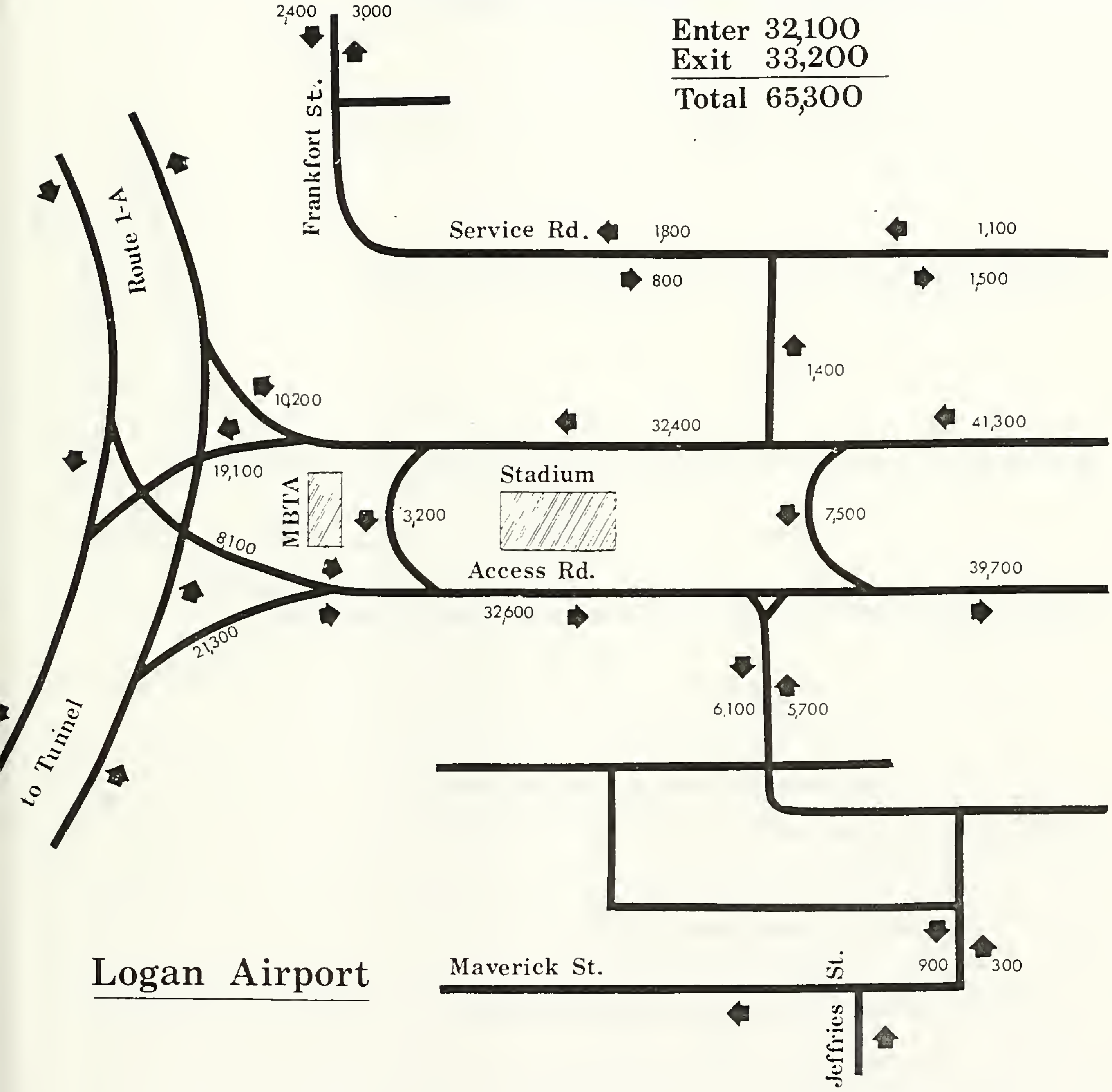
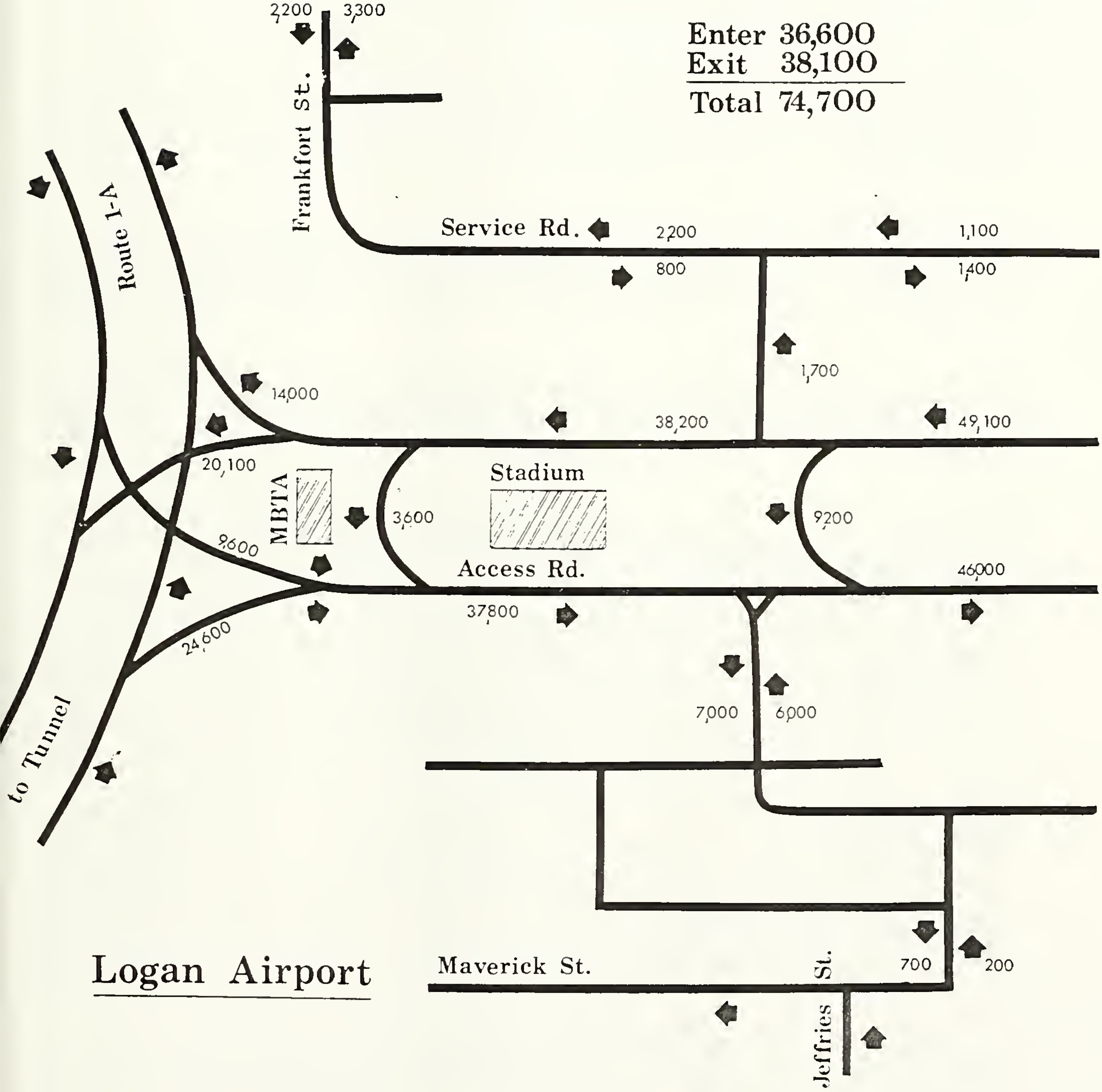


Figure:4

Annual Average Sunday Traffic-1990



ATTACHMENT

METHODOLOGY FOR ESTIMATING 1990 AIRPORT TRAFFIC

The primary inputs for the 1990 estimates of traffic entering and leaving Logan Airport are the hourly data from the Automatic Traffic Monitoring System (ATMS) and the 1989 Cordon Count which was prepared for Massport by Bruce Campbell and Associates, Inc..

From the hourly data of the Automatic Traffic Monitoring System the average daily traffic estimates by month and day of week were calculated for each lane of traffic passing over the ramps entering the Airport, the southbound ramp to Route 1A and the MBTA ramp.

Previous reports by Massport consultants have shown that the ATMS data is contaminated by weaving traffic, and this was further confirmed by the 1989 Cordon Count. The weaving factor in the ATMS data was corrected through the use of multiple linear regression analyses.

In these analyses the hourly cordon counts were the dependent variable, and the corresponding set of hourly ATMS lane counts the independent variables. The cordon counts were conducted over a 60 hour period, that is two 24 hour periods and one 12 hour period. For the cordon counts on the four ramp stations a full complement of ATMS data was available. Since the cordon counts included the early morning hours of very light traffic as well as the peak hours of very heavy traffic the analysis could be performed over a wide spectrum of traffic conditions with a minimum of 55 degrees of freedom.

The analyses yielded r-squares of 0.91 for the entry ramp from Route 1A SB. For the three other ramps the r-squares were all above 0.97. The analysis yielded also very low constant terms, below 1% of the maximum hourly traffic. Since the data is well fitted with a straight line that passes close to the origin, one can conclude that most of the weaving is due to driver positioning rather than road congestion. This in turn gives one confidence in using the regression equations for estimating the actual average daily traffic from the ATMS data.

Since the ATMS actually counts axles not vehicles, a correction for vehicles with more than two axles is required. The cordon counts which classified vehicles by type were used to make these required adjustments.

The estimated traffic leaving the airport by the northbound

ramp was estimated during the early part of the year from the ATMS counts. However, the counter on this ramp ceased to operate March 18. Therefore, the annual estimates were based on these estimates and closure. However, since for any specific day of the week the traffic entering and leaving Logan is not in balance, closure cannot be used for estimating the day of the week traffic. To obtain day of the week estimates for the northbound exit ramp, the annual daily estimate was distributed by day of the week as a function of the daily difference in parking lot exits.

The estimates for traffic entering and leaving via Frankfort Street are based on 1990 Vanesse-Hangen-Brustlin counts, seasonal air traffic factors, and the axle ratios of the 1989 cordon count.

The Maverick Street estimates are based on the cordon counts and the Vanesse-Hangen-Brustlin counts which were made during 1989 and 1991.

A model for the internal traffic flow along the access and egress roads was constructed from the daily and hourly traffic counts for the week of April 21, 1989. In constructing such a model one needs to assume that the traffic entering and leaving an intersection balances. To make this possible it is necessary to decide which legs of an intersection should be based on empirical measurements and which should be calculated. In making this determination it was decided to give the greatest veracity to the legs which have a single traffic lane or a single lane in each direction. These legs will have the least weaving and thus presumably the most accurate counts. Models based on these principles were constructed for weekday, Saturday, Sunday and average daily traffic. The models were expanded proportionally by the ratio between the traffic during the week of April 21, 1989 and the 1990 traffic entering and exiting Logan over the different access and egress roads on the average day, weekday, Saturday and Sunday.

APPENDIX B

Monthly and Annual Ground transportation Usership Statistics of Logan Passengers and Mode Choices

(1987 to 1990)

AIR PASSENGERS

	1987	1988	1989	1990
January	1,518,690	1,576,236	1,557,246	1,595,160
February	1,674,673	1,703,066	1,572,438	1,594,385
March	2,085,627	2,058,758	1,899,139	2,017,818
April	2,108,239	2,051,040	1,863,554	1,991,081
May	2,076,289	2,033,986	1,876,325	1,935,235
June	2,046,830	2,110,726	2,012,574	2,105,013
July	2,140,800	2,120,783	2,004,732	2,063,879
August	2,244,128	2,365,964	2,178,020	2,223,462
September	1,917,558	2,012,756	1,846,157	1,945,298
October	2,057,271	2,196,773	2,028,876	2,067,204
November	1,746,741	1,862,965	1,790,584	1,735,699
December	1,664,015	1,623,117	1,643,045	1,603,957
Totals	23,283,047*	23,732,923	22,272,690	22,878,191
Average Monthly Air passengers	1,940,000	1,978,000	1,856,000	1,907,000

* does not include General Aviation passengers (85,955 in 1987) -- 1988 through 1990 passenger numbers do include General Aviation passengers

General Aviation passengers in:	1988	71,916
	1989	56,257
	1990	64,124

(With regard to Table 1, p 4 - in 1981 to 1986, General Aviation passengers ranged from 40,000 to 70,000 per year).

Airport Shuttle
(MBTA)

	1987	1988	1989	1990
January	189,146	184,709	166,047	171,443
February	183,828	184,085	161,804	178,822
March	241,610	230,169	230,841	242,505
April	242,968	228,037	202,948	227,853
May	254,198	240,272	257,133	232,122
June	249,939	253,757	280,026	244,181
July	261,015	266,801	276,831	254,061
August	270,628	275,705	294,669	285,247
September	234,515	256,817	245,368	258,319
October	265,015	266,771	270,058	283,828
November	247,065	287,812	277,513	253,082
December	217,795	219,720	196,465	222,854
Total Annual	2,857,722	2,894,655	2,859,703	2,854,317
Monthly Average	238,143	241,221	238,309	237,860
Ratio of Annual MBTA Usage to Annual Total Passengers	0.122	0.122	0.128	0.124

TAXI *

	1987	1988	1989	1990
January	99,729	105,657	107,325	113,583
February	92,502	97,640	92,292	101,428
March	---	124,467	120,558	124,221
April	116,305	119,097	117,145	124,823
May	111,849	122,318	116,405	116,765
June	112,897	119,231	118,997	114,385
July	101,026	106,145	101,726	104,475
August	105,169	113,634	113,031	107,695
September	109,486	118,593	115,122	109,546
October	119,926	131,796	130,115	125,539
November	106,176	117,629	119,045	109,451
December	87,583	87,890	91,940	78,507
Total	1,162,648	1,364,097	1,343,701	1,330,418
Monthly Average	96,887	113,675	111,975	110,868
Ratio of Annual Dispatched Taxis to Annual Logan Passengers	0.050	0.057	0.061	0.058

* Taxis dispatched for outbound users

PARKING EXITS

	1987	1988	1989	1990
January	221,993	242,983	245,849	264,503
February	221,528	232,792	223,354	235,541
March	267,116	287,782	297,400	296,799
April	264,289	273,004	293,312	284,207
May	262,719	286,413	299,258	287,795
June	270,022	306,001	331,047	310,125
July	297,382	330,574	333,721	323,579
August	297,419	348,198	355,766	332,378
September	237,822	283,059	278,949	265,966
October	243,858	286,627	286,148	270,207
November	233,683	247,580	261,661	239,592
December	260,585	257,059	281,205	254,329
Total	3,078,416	3,382,072	3,487,670	3,365,021
Monthly Average	256,535	281,839	290,639	280,418
Ratio of Annual Parking Exits to Annual Total Passengers	0.132	0.142	0.157	0.147

APPENDIX C

Logan Express and Water Shuttle Ridership

(1987 to 1990)

FRAMINGHAM
LOGAN EXPRESS

	1987	1988	1989	1990
January	8,213	12,590	14,451	15,086
February	9,642	15,032	15,050	16,733
March	12,918	17,558	17,558	19,409
April	14,773	18,488	17,817	18,723
May	15,155	18,097	18,243	18,642
June	14,984	17,325	18,491	18,662
July	15,742	16,785	16,654	15,594
August	16,041	18,189	18,094	17,311
September	14,758	16,157	16,100	15,695
October	17,111	18,282	18,080	19,620
November	15,630	18,269	17,837	18,402
December	14,909	16,516	15,976	15,690
TOTAL	169,876	203,288	204,351	209,567
Monthly Average	14,156	16,941	17,029	17,464
Ratio of Average Annual Framingham Express Users to Total Annual Passengers	0.007	0.009	0.009	0.009

QUINCY/ADAMS - BRAINTREE
LOGAN EXPRESS

	1987	1988	1989	1990
January	3,930	6,868	8,157	7,861
February	4,446	8,320	8,871	9,306
March	6,374	9,733	10,060	11,485
April	7,000	10,407	10,503	11,642
May	7,905	10,446	10,682	10,568
June	7,264	9,672	9,913	10,101
July	7,688	9,593	9,559	8,642
August	7,814	10,660	10,523	10,738
September	6,901	9,297	9,483	10,854
October	8,413	10,493	10,648	14,700
November	8,835	11,428	10,782	14,091
December	8,124	9,583	8,765	11,886
TOTAL	84,694	116,500	117,946	131,874
Monthly Average	7,058	9,708	9,829	10,990
Ratio of Annual Quincy/Adams Express Users to Total Annual Passengers	0.004	0.005	0.005	0.006

* Service between Braintree and Logan began on July 16, 1990 replacing the service between Logan and Quincy Adams.

WATER SHUTTLE

	1988	1989	1990
January	5,917	9,598	8,382
February	7,494	9,055	8,965
March	12,404	13,651	12,737
April	12,843	15,083	13,771
May	16,611	17,686	16,605
June	23,265	20,931	21,093
July	19,682	18,208	19,702
August	24,130	21,074	22,764
September	21,217	16,936	18,302
October	20,198	18,037	17,817
November	17,443	13,628	13,001
December	12,627	8,504	8,391
TOTAL	193,831	182,391	181,530
Monthly Average	16,152	15,199	15,128
Ratio of Average Annual Water Shuttle Users to Total Annual Passengers	0.0082	0.0081	0.0079

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APPENDIX D

Proposed Rule on the Amendment to the Logan Parking Freeze as it appears in the *Federal Register*, Nov. 6. 1990

C. Special flight permits may be issued in accordance with FAR 21.197 and 21.199 to operate airplanes to a base in order to comply with the requirements of this AD.

All persons affected by this directive who have not already received the appropriate service documents from the manufacturer may obtain copies upon request to Boeing Commercial Airplane Group, P.O. Box 3707, Seattle, Washington 98124. These documents may be examined at the FAA, Northwest Mountain Region, Transport Airplane Directorate, 1601 Lind Avenue SW., Renton, Washington.

Issued in Renton, Washington, on October 26, 1990.

Darrell M. Pederson,

Acting Manager, Transport Airplane Directorate, Aircraft Certification Service.

[FR Doc. 90-26182 Filed 11-5-90; 8:45 am]

BILLING CODE 4910-13-M

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 52

[FRL-3857-8]

Approval and Promulgation of Air Quality Implementation Plans; Massachusetts; Logan Airport and East Boston Parking Freeze

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule.

SUMMARY: EPA is proposing to approve a revision to the State Implementation Plan (SIP) submitted by the Commonwealth of Massachusetts. The intent of the SIP revision is to reduce vehicular emissions of carbon monoxide, hydrocarbons and nitrogen oxides. The pollutants contribute to the carbon monoxide and ozone air pollution problems in the Boston urbanized area. This SIP revision amends the Logan Airport Parking Freeze by increasing the types of parking spaces included, by committing to implement transportation control measures and by increasing the number of commercial spaces by 2,000 spaces, plus an amount equal to the number of employee parking spaces removed from use. The SIP revision also changes the area of coverage of parking freeze to include parts of East Boston adjacent to Logan Airport. The intended effect of this action is to propose approval of the changes to Massachusetts' SIP. This action is being taken under Section 110 of the Clean Air Act.

DATES: Comments must be received on or before December 6, 1990. Public comments on this document are requested and will be considered before taking final action on this SIP revision.

ADDRESSES: Comments may be mailed to Louis F. Gitto, Director, Air, Pesticides and Toxics Management Division, U.S. Environmental Protection Agency, Region I, JFK Federal Bldg., Boston, MA 02203. Copies of the State submittal and EPA's technical support document are available for public inspection during normal business hours at the Air, Pesticides and Toxics Management Division, U.S. Environmental Protection Agency, Region I, One Congress Street, 10th Floor, Boston, MA 02203; Public Information Reference Unit, U.S. Environmental Protection Agency, 401 M Street SW., Washington, DC 20560; and the Division of Air Quality Control, Department of Environmental Protection, One Winter Street, 8th Floor, Boston, MA 02108.

FOR FURTHER INFORMATION CONTACT: Thomas F. Wholley (617) 565-3233; FTS 835-3233.

SUPPLEMENTARY INFORMATION: In submittals dated August 4, 1989, December 6, 1989 and March 23, 1990, the Massachusetts Department of Environmental Protection (DEP) proposed a revision to its State Implementation Plan (SIP) amending the Logan Airport Parking Freeze, 310 CMR 7.30, and inserting provisions for an East Boston Parking Freeze at 310 CMR 7.31.

Background

The Logan Airport Parking Freeze program was established on June 12, 1975 when EPA promulgated an amendment to the transportation control plan regulations for the Metropolitan Boston Intrastate Air Quality Control Region (40 FR 25152). The parking freeze was developed as one part of a comprehensive strategy to reduce air pollution caused by automobile emissions. The Boston Metropolitan Planning Organization (MPO) submitted to Massachusetts DEP the Logan Airport Parking Freeze program to be incorporated in the 1979 SIP (45 FR 61293) and again in the 1982 SIP (48 FR 51480). The Massachusetts Port Authority (Massport) was delegated the authority to implement the Logan Airport Parking Freeze by the Commonwealth of Massachusetts on October 8, 1975. Since the delegation, Massport has operated the program and submitted reports to EPA describing the implementation of the parking freeze.

The proposed SIP revision was submitted by the Boston MPO to the Massachusetts DEP in November of 1988. DEP proposed regulations in July of 1989 and held a hearing in August of 1989. A technical amendment regarding the boundary of the East Boston freeze area was proposed in December of 1989 and a hearing was held in January of 1990. In submittals to EPA dated August 4, 1989, December 6, 1989 and March 23, 1990, the Massachusetts DEP proposed a revision to its SIP.

Summary of SIP Revision

Types of Parking Spaces Included in the Freeze

The proposed SIP revision covers commercial, employee, Park and Fly and Rental Motor Vehicle parking spaces. Only commercial parking spaces were covered by the 1982 SIP parking freeze. But because each motor vehicle generates air pollution, regardless of the type of parking space it uses, it appears appropriate to include all airport-related parking in the freeze. EPA is interested in receiving comments on the types of parking spaces to be included in the parking freeze.

Number of Parking Spaces

The proposed SIP revision limits the number of commercial and employee parking spaces at Logan Airport to 19,315. No more than 7,100 spaces shall be employee spaces and no fewer than 12,215 shall be commercial. The SIP revision increases the existing number of commercial parking spaces (10,215) at Logan Airport by 2,000 and allows Massport to eliminate 2,000 employee spaces by relocation outside of the freeze area, or by promoting the use of alternate transportation by employees, within a three year period. The number of commercial spaces at Logan Airport can then be increased by a number equal to the number of employee parking spaces eliminated. The Park and Fly and Rental Motor Vehicle spaces will be frozen in East Boston at the number of spaces identified in an inventory prepared by the City of Boston and submitted to Massachusetts DEP. In addition, the SIP revision creates a category of restricted use parking spaces. These spaces can only be made available free of charge on up to ten days per calendar year during extreme peak travel periods. Each year, Massport must report on the use of restricted use parking spaces by dates, locations and numbers. If restricted use parking spaces are used on more than ten days in a calendar year, Massport must submit a plan and schedule for initiating actions to eliminate future need for restricted parking spaces. In the East Boston Parking Freeze area, the proposed SIP revision would freeze the

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number of Park and Fly and Rental Motor Vehicle spaces at existing levels. EPA is interested in receiving comments on the numbers and types of parking spaces allowed under the parking freeze, on the conversion of employee to commercial parking and on the restricted use parking provisions.

Parking Freeze Area

The proposed SIP revision expands the area of the parking freeze to include all of Logan Airport and all of East Boston except for two northern parcels. The 1982 State Implementation Plan (SIP) only included Logan Airport in the parking freeze area. As a result, airport-related parking activities have developed in East Boston outside of Logan Airport, increasing traffic congestion and air pollution. EPA is interested in receiving comments on the area proposed to be covered by the parking freeze.

Transportation Management Programs

The 1982 SIP included limited transportation control measures for Logan Airport. Over the past several years, Massport has voluntarily implemented several transportation management programs, such as the water shuttle to Boston and bus service to remote lots south and west of Boston. The proposed SIP revision incorporates these measures and imposes additional obligations by requiring Massport to identify, analyze and implement specific transportation management programs which discourage vehicle travel to Logan Airport. These measures and programs include fringe parking lots, water shuttle service, mass transit improvements and pricing strategies. Each year, Massport will submit a status report on the transportation management programs to the City of Boston, the Boston Metropolitan Planning Organization, Massachusetts DEP and EPA. EPA solicits comments on the proposed transportation management program provisions.

Air Quality Impacts

The proposed SIP revision is designed to reduce vehicle miles of travel (VMT) by restricting the number of parking spaces serving Logan Airport and by providing alternative means of travel to Logan Airport. Employees and travellers will be encouraged to use alternative transportation to Logan Airport, leading to reduced VMT in the area. To the extent that reductions in local and regional VMT improve traffic flow, subsequent reductions in carbon monoxide and ozone may be achieved. Air quality improvements can be achieved by the proposed SIP revision for the following reasons. First, the inclusion of all airport-related parking spaces will impose a limit on the number of parking spaces available. Second, the area of the parking freeze will be expanded. Finally, the transportation management programs will provide alternative modes of travel to Logan Airport.

The proposed SIP revision allows employee spaces at Logan Airport to be replaced by commercial spaces. Traffic studies have revealed that employee spaces generate more vehicle trips to and from Logan Airport than commercial spaces. In addition, the implementation of transportation management programs will ensure that alternative modes of transportation to Logan Airport will be available. Convenient and reliable transportation, other than automobilies, is essential to minimizing VMT. EPA is interested in receiving comments on the air quality impacts of the proposed parking freeze measures.

EPA's review of this material indicates that the proposed SIP revision will result in improved air quality. EPA is therefore proposing to approve the Massachusetts SIP revision for the Logan Airport and East Boston Parking Freeze. EPA is soliciting public comments on the issues discussed in this notice or on other relevant matters. These comments will be considered before taking final action. Interested parties may participate in the Federal rulemaking procedure by submitting written comments to the EPA Regional office listed in the *Addresses* section of this notice.

Proposed Action

EPA is proposing to approve the SIP revision to the Logan Airport and East Boston Parking Freeze.

Under 5 U.S.C. 605(b), I certify that this SIP revision will not have a significant economic impact on a substantial number of small entities. (See 46 FR 8709.)

This action has been classified as a Table 2 action by the Regional Administrator under the procedures published in the Federal Register on January 19, 1989 (54 FR 2214–2225). On January 6, 1989, the Office of Management and Budget waived Table 2 and 3 SIP revisions (54 FR 2222) from the requirements of Section 3 of Executive Order 12291 for a period of two years.

Nothing in this action should be construed as permitting or allowing or establishing a precedent for any future request for SIP revision to any state implementation plan. Each request for revision to the state implementation plan shall be considered separately in light of specific technical, economic, and environmental factors and in relation to relevant statutory and regulatory requirements.

The administrator's decision to approve or disapprove the SIP revision will be based on whether it meets the requirements of section 110(a)(2)(A)–(K) and 110(a)(3) of the Clean Air Act, as amended, and EPA regulations in 40 CFR part 51.

List of Subjects in 40 CFR Part 52

Air pollution control, Carbon monoxide, Hydrocarbons, Incorporation by reference, Intergovernmental relations, Nitrogen dioxide, Ozone, Particulate matter, Reporting and recordkeeping requirements, Sulfur Oxides.

Authority: 42 U.S.C. 7401–7642.

Dated: October 26, 1990.

Paul Keough,

Acting Regional Administrator Region I.

[FR Doc. 90–26234 Filed 11–5–90; 8:45 am]

BILLING CODE 6560-50-M

DEPARTMENT OF HEALTH AND HUMAN SERVICES

Health Care Financing Administration

42 CFR Part 405

[BPO-085-P]

RIN 0938–AE45

Medicare Program; Offset Medicare Payments to Individuals to Collect Past-Due Obligations Arising From Breach of Scholarship and Loan Contracts

AGENCY: Health Care Financing Administration (HCFA), HHS.

ACTION: Proposed rule.

SUMMARY: This proposed rule sets forth the procedures to be followed for collection of past due amounts owed by individuals who breached contracts under certain scholarship and loan programs. The programs that would be affected are the National Health Service Corps Scholarship, the Physician Shortage Area Scholarship, and the Health Education Assistance Loan. These procedures would apply to those individuals who breached contracts under the scholarship and loan programs and who—

- Accept Medicare assignment for services;
- Are employed by or affiliated with a provider, Health Maintenance Organization, or Comprehensive

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